IN-FLIGHT WEATHER AND TACTICAL WEATHER DECISION MAKING

IN-FLIGHT WEATHER DECISIONS AND IMPACTS

OBJECTIVE

I can analyze a pilot's use of in-flight weather resources and whether or not the pilot's decisions and courses of action effectively follow the 3P model of Perceive, Process, and Perform.

PROCEDURE

Have the students watch the following video. As they think about the accident, and answer the questions that follow, students should keep in mind the 3P model.

VIDEO: AOPA Air Safety Institute video titled **Accident Case Study: VFR into IMC** https://safeYouTube.net/w/7HLq

GROUP QUESTIONS

As a group, discuss the following questions and write down a summary of your group's responses on your own activity sheet:

1. What opportunities did the pilot have, or miss, to **perceive** the circumstances of the weather and his flight?

   Answers may vary, but may include: During the FSS preflight briefing (2:26), VFR flight is not recommended; precipitation along his route (2:45); VFR flight not recommended again at (3:45); takeoff time is about 1 hour and 20 minutes after the briefing, so he did not perceive how much the weather could degrade in that time.

   He is communicating with ATC (VFR flight following) during his entire flight, but for two hours (4:22) he does not inquire about the weather ahead of him. ATC takes the initiative to inform him of poor conditions ahead.

   The pilot fails to perceive the validity of the ATC report (4:44) since he can see horizontally for "40 miles." He does not seem to perceive that weather below his altitude could be worse than what he sees; however, he calls FSS on the Flight Watch frequency, 122.0 (5:03). This is certainly processing that there may be difficult weather conditions ahead, and he performs by calling FSS. On this radio call, FSS again says that VFR flight is not recommended; he fails to perceive the importance of this notification.

   At 6:45 in the video, he perceives his skills to be good enough to "pick through" the weather. He does not perceive this dangerous overconfidence.

   The pilot seems not to perceive that he is flying very low (about 100 feet above the ground) with rapidly-rising terrain on both sides of him (14:00). This will prevent him from safely turning around.

2. How did the pilot **process**, or **fail to process**, the impact of the changing weather on the safety of his flight?

   Answers may vary, but may include: At 5:03 in the video, he has probably processed the fact that the weather could become an obstacle to landing at Spanish Fork (his intended destination), so he calls FSS in the air.

   At 8:20, the pilot has failed to process the information received from Flight Watch, and,15 minutes later in his flight, information from ATC about clouds from his altitude to the ground.

   When his radio transmissions become "garbled and broken" (8:48), he does not process the fact that he is flying at a dangerously low altitude.

   At 10:10 in the video, the pilot has received multiple notices of deteriorating conditions, he sees lowering clouds, he has difficulty maintaining radio contact with ATC, and ATC now needs to relay messages to him via pilots in an overflying airliner. These facts should have been processed by the pilot, and he should have come to the conclusion that he needed to return to better conditions.

   Flying at only 300 feet above the ground in bad weather conditions was not processed by the pilot as unwise (11:22).

3. In what ways could the pilot have **performed** differently, or made a better tactical weather decision?

   Answers may vary, but may include:

   When the pilot received the notification that VFR flight was not recommended in his preflight briefing, he could have performed differently by not making the trip on this day.

   After receiving weather advisories from ATC at 4:22, the pilot could have landed to wait out the poor weather, or he could have returned to Billings.

   The pilot did not use (perhaps he did not have) any type of multi-function display weather products. We do not know if he monitored any ATIS/ASOS/AWOS frequencies.

   The pilot performed in a positive way by calling Flight Watch for an update on the weather conditions at Evanston (along his route) and Provo (close to his destination); however, he did not perceive or process the severity of the deteriorating conditions.

   The pilot descends below lowering clouds (9:45), but a better performance would have been to turn around and return northeast to better conditions.

   The pilot mentioned on more than one occasion that he was following highways. If landing at another airport was not possible, he could have landed on the highway or median rather than impact terrain.

4. How could the pilot have better managed the resources at his disposal?

   Answers may vary, but may include:

   If flying and processing all of the information was a challenge, perhaps using the autopilot would have allowed the pilot to think more clearly about his ability to complete the flight safely.

   The pilot did take advantage of important resources: FSS, Flight Watch, and ATC. He may have listened to ATIS, ASOS/AWOS broadcasts as well; however, he did not perceive the severity of the information presented to him nor did he process the fact that conditions were deteriorating quickly.

INDIVIDUAL QUESTIONS

Individually, answer the following questions:

5. What forms of weather can ATC radars display?

   precipitation (intensity only)

6. Though ATC radar cannot detect clouds or turbulence, ATC often passes on cloud bases, cloud heights, and turbulence information to aircraft in their area. What reliable source does this information come from?

   pilot reports (PIREPs)

7. One of the primary reasons for studying aircraft accidents is to determine lessons that can be learned to prevent similar mishaps from occurring in the future. Considering all that you've learned about weather and weather products to this point, what are some lessons you can draw from this accident—either things done badly or things done well—that a pilot can apply to his future flights?

   Answers will vary, but may include:

   Being self-aware and recognizing when becoming overwhelmed as a pilot, and then choosing to reduce the workload rather than continue into an area of high workload (ie, divert rather than fly into bad weather).

   Departing with a distinct set of contingency plans (a Plan B or even C, D, and E) firmly in mind is important. The pilot must be willing to accept that returning to the departure airport, diverting, or circling in a hold are all possible aspects of the flight ahead.

   No single weather product tells the entire story, and it is the pilot's responsibility to get the full story and ultimately make the correct decision.

   When ATC offers information, they are generally doing so out of experience. They recognize the severity of the weather, and other aircraft may have already had issues with it.

8. The pilot in this incident did not appear to have any advanced cockpit technology such as a multi-function display (MFD) allowing him to see NEXRAD images and terrain maps. If those technologies were on board, do you feel the outcome of the flight would have been different? Why?

   Perhaps with the graphical representations of the poor weather right in front of him, he would have been more likely to perceive the problems, process the need to divert, and perform a Plan B.

   If the technology depicted terrain as well, the pilot could have executed a climb above the clouds (possibly) or a safe turn within the rising terrain surrounding him. Better yet, he may have seen the problems well before putting himself in a precarious position.

9. Whether talking about airlines, cargo carriers, or general aviation, who is the final authority in the decision to continue or discontinue a flight due to the impact of weather on the flight's safety?

   the pilot-in-command